

# THE ANNALS

AND

## MAGAZINE OF NATURAL HISTORY.

[THIRD SERIES.]

No. 86. FEBRUARY 1865.

---

XI.—*Carcinological Gleanings*.—No. I.

By C. SPENCE BATE, F.R.S. &c.

[Plate I.]

A SYSTEMATIC series of dredgings of the coasts of the Shetland Islands having been determined on by the British Association, the carrying out of the labour was entrusted to a committee.

The object with which the dredgings were undertaken was to ascertain the relative distribution in the sea of the Mollusca. It was therefore with the zeal of true naturalists that, while collecting the shells, the committee provided for the preservation of other animals.

It is by this means, chiefly through the kindness of Mr. Jeffreys, that a tolerably fair collection of Crustacea from this locality has found its way into my possession. Among them are a few Diastylidæ that have not hitherto, as I believe, been described.

They consist of two species of the genus *Diastylis* (to which I have added a third from a still more northern locality) and one of a genus that is new to science. This last is certainly a very remarkable Crustacean. Unfortunately, it is not perfect, being deficient of the four last segments of the pleon. The preserved parts indicate an intermediate position between the true Diastylidæ and the Mysidæ.

*Diastylis echinatus*. Plate I. fig. 1.

Carapace about one-third the entire length of the animal, and as deep as half its length. The extremities of the antero-lateral projections meet above anteriorly, and are elevated slightly upwards into a short rostrum, serrated dorsally and anteriorly and tipped with a stout spine.

A serrated ridge traverses the antero-lateral margin sub-

parallel with the edge of the carapace. A second serrated corrugation is situated a little behind the first, one-half of which is subparallel with the dorsal surface; the other half lies at a right angle to it, and is subparallel with the anterior margin of the carapace, and corresponds somewhat with the direction of the first ridge, but extends to less than half its length. The angle formed by the two lines is surmounted by a strong spine; a similar spine marks the centre of each divergent line.

Situated still posteriorly is a third serrated ridge. It originates near the centre of the median dorsal line, and appears to repeat the second line, that is, it traverses first a line diagonally produced anteriorly, and then suddenly bends at an angle that is rather less than a right angle; proceeding downwards and backwards, it terminates in a semicircular bend. Lower down (that is, nearer to the lateral margin) this semicircular serrated ridge is twice repeated, the anterior of which, from its position, appears to correspond with the line of the second ridge, of which it may be an imperfect continuation. The third ridge, like the second, has the angle that is made by its change of direction tipped with a strong spine: a similar spine stands near the middle of the upper half; but the lower half is not so marked. A strong spine occupies the centre of the dorsal line at the point where the third ridge meets the one upon the opposite side. Two other somewhat stronger spines occupy the median line posteriorly to the one mentioned, and a third, much smaller, stands upon the extreme limit of the posterior margin of the carapace. Two spines on each side, subequally distant from each other and the central, also stand upon the posterior margin; and the carapace is armed all over with subequidistantly placed, short, stout spines.

The eye is situated in a deep notch in the median line corresponding with the anterior point of the second serrated ridge. Behind, near the median line, but on each side of it, are two closely placed small spines, and still further back in the median line are two strong spines, subequally distant from each other and from the organ of vision.

The pereion has four somites exposed behind the carapace, the first of which is narrow, and narrows laterally until it is lost beneath the carapace; it is serrated along the anterior margin, and armed on the dorsal median line with a short strong spine. The second somite is broader than the first, and increases in width towards the lateral extremities. The dorsal median line is crowned by a central spine that is longer than that on the first, and a small lateral spine or tooth that is planted close but slightly anterior to it; the anterior margin, for about half the extent of the somite, is slightly serrated.

The third somite is slightly broader than the second, and, like it, increases a little in width towards the lateral edge, but curves backwards instead of forwards. The anterior margin is smooth, and the dorsal median line is furnished with a central spine and a small lateral one placed a little anteriorly to it.

The posterior somite is broader still than the preceding, and increases in extent laterally to nearly two-thirds of its depth, where it is produced both anteriorly and posteriorly into a prominent tooth, after which it suddenly decreases to the margin; dorsally it is armed in the median line with a strong tooth, and laterally with one that is longer and less robust.

The pleon is as long as the pereion and cephalon together, and therefore half the length of the animal. The first somite is rather deeper than long, and armed upon the dorsal surface with a central upright tooth. The second somite is proportioned like the first, but is furnished with two, parallel, submedian, vertical teeth. The third and fourth are similar to the second; but the teeth gradually decrease posteriorly. The fifth somite is much longer on the ventral than on the dorsal surface; the dorsal spines are attached to the posterior ridge, and anteriorly directed. The sixth is a little longer than broad, and unarmed. The telson is nearly three times as long as the sixth somite of the pleon, and posteriorly serrated along the dorsal surface.

The superior antennæ are not visible in the perfect animal; the inferior project a little beyond the extremity of the rostrum. The first pair of pereopoda are long and powerful, projecting to some distance beyond the extremity of the inferior antennæ. The second are shorter, and terminate in a few hairs. The three last are uniform, and about the same length as the second; they are curved anteriorly, and have the coxæ short and as broad as the somites of the pereion to which they respectively belong. The bases are long; the ischia are short; the mera and carpi are moderately long and subequal. The propodi are very small and short, and the dactyli are long and pointed.

The first five somites of the pereion are not furnished with appendages in our specimen. We have therefore little doubt that it is a female. The sixth somite is furnished at the postero-inferior angles with a pair of pleopoda, of which the peduncle is nearly three times as long as the somite to which it is an appendage; the rami are rather more than half the length of the peduncle, and terminate in styliform points. The telson is as long as the peduncle of the caudal pleopoda, and narrows ventrally after it has passed the terminal outlet of the alimentary canal.

The length of the animal is about half an inch. It was taken

by the dredge, in the summer before last, at the Shetlands; but Mr. Jeffreys, from whom I received it, has not recorded the exact position or depth at which it was taken.

*Diastylis bicornis*. Pl. I. fig. 2.

The carapace is less than a third of the length of the animal, and pointed in front to a blunt rostrum. It is furnished laterally upon each side, in a line with the dorsal eye, with a small anteriorly projecting tooth, behind and a little outside of which is a second much larger tooth, which, together with the one upon the opposite side of the carapace, gives the double-horned character to the species, from which the name is derived. In the posterior or cardiac region of the carapace, a little on each side of the median line, is a small spine. The lateral walls or branchial regions are thickly studded with small pointed teeth or spines, planted in short rows in a direction vertical to the lateral margins, the spines becoming more feeble and ultimately dying out as they approach towards the dorsal surface. These spines are all directed forwards, and are most abundant as well as most important in size near the hepatic region, anterior to which they again diminish in proportion.

The pereion exposes dorsally four perfect somites posterior to the carapace, of which the posterior is the longest. All are smooth and free from ornamentation.

The pleon is long and slender, the first somite being nearly as long as broad; the second, third, and fourth each gradually increase in length, and are all furnished near the postero-lateral extremity with a few cilia. The fifth somite is still narrower and longer; the sixth is as long as the fifth, but increases in breadth posteriorly to furnish points for the articulation of the posterior pair of pleopoda.

The telson is long and narrow, being lanceolate and tipped with a long process that is ciliated upon each side.

The eye is small, and dorsally placed. The antennæ are small, or supposed to be so, since they are not discernible in our unique specimen. The first pair of pereopoda reach to some distance beyond the extremity of the rostrum. The last three pairs are uniform in shape and size, and terminate in pointed but not very powerful dactyli and a few corresponding cilia.

The pleon in our specimen is not supplied with appendages; and the entire animal is about half an inch in length.

It was dredged with the preceding; but neither the exact locality in the Shetlands nor the depth at which it was taken has been recorded.

*Diastylis borealis*. Pl. I. fig. 3.

The carapace is much deeper anteriorly than it is posteriorly; the antero-lateral processes of the mandibular segment do not meet on the dorsum, but form two distinct arcuate margins. The infero-anterior margin is strongly serrated. The rostrum is short and blunt at the extremity. The anterior surface of the carapace is ornamented with several short spines, placed in rows, that traverse a direction coinciding somewhat with that of the anterior margin. The posterior portion of the surface possesses a reticulated appearance, owing apparently to the cellular structure of the tissue. The margins of the exposed segments of the pereon are smooth, and the last is produced posteriorly into a strong tooth.

The antennæ are short; the superior do not extend beyond the extremity of the rostrum, the peduncle being shorter and broader than the flagellum. It carries four cilia—two on the terminal articulus and one on each of the others. The inferior antennæ are longer than the upper, and consist of a peduncle, of which only two joints are exposed. The flagellum consists of six articuli, of which the first is the shortest, the second is the longest, and the remaining four gradually decrease in length towards the extremity; a small secondary appendage, consisting of two or three articuli, is attached to the extremity of the peduncle.

The appendages attached to the first and second somites of the pleon of the male are bifurcate at the extremity. The third and fourth somites have two pairs of strong hairs corresponding in position to the appendages in the two previous somites; the fifth somite is without appendages or hairs, and is half as long again as the preceding. The sixth somite is about the same in length as the fifth, and terminates laterally in two long appendages (pleopoda), the basal joint of which is rather more than twice the length of the sixth somite, and is furnished with spines on the inner side: at the extremity of the basal joint are two subequal rami; the inner is furnished with a series of spines on the inner margin, corresponding to and continuous with those upon the basal joint. The outer ramus is clean and slightly longer, and terminates in several cilia, which, by their close approximation, generally make the outer ramus appear longer than the inner. The telson reaches to about the extremity of the basal joint of the terminal pleopoda, and terminates bluntly, and is furnished with four or five spines or stiff hairs, similar to those on the inner margins of the pleopoda. Length of animal rather more than half an inch.

The specimen from which this description is taken was brought up from a depth of 10 to 15 fathoms, in Port Kennedy, by



Dr. Walker, who obtained it during Sir F. L. M'Clintock's last Arctic expedition. It is preserved in the Dublin Museum.

I take this to be the same as the smaller specimen figured by Professor Thomas Bell in his account of the Arctic Crustacea brought home by Sir Edward Belcher, and supposed by him to be either a male or immature specimen of *Diastylis* (*Alauna*) *Goodsiri*, although they "differ in some characters, as the less convex form of the carapace, more obvious rugæ on the fore part of it, and the existence of an acute point on each side of the last leg-bearing" somite.

From this the specimen now described differs in such minute points as may be only errors in figuring, or at most minor variability in individual character—as, for instance, the apparently less regularity of the rows of small spines on the anterior surface of the carapace, and the serrated condition of the antero-inferior margin of the carapace.

I must also allude to the remarkable circumstance of a secondary appendage being attached to the inferior pair of antennæ in this specimen, which I have never seen or known of its having been observed in any of the genera. Undoubtedly it homologizes with the squamiform appendage attached to the third joint of the inferior antennæ of the Macrurous Decapods, and is consequently the homotype of the secondary appendage so common to the superior antennæ of Crustacea in all orders, and to which in our present specimen it bears some considerable resemblance. In the inferior antennæ the peduncle normally consists of five joints; but in this the organ assimilates to the character of the superior antennæ. Thus we perceive that the two joints usually existing beyond the secondary appendage are here reduced to the condition of those inferior joints which we describe as articuli.

This condition of the antennæ in this group of Crustacea demonstrates very forcibly the depauperized character of the animals—a circumstance that suggests the probable liability to some more or less variation in those organs which have suffered depreciation from the normal type, but are essential to the welfare of the existence of the animal. It is under such considerations as these that I am led to the belief that impoverished appendages such as these antennæ are can have but little diagnostic importance in the determination of specific characters.

#### NANNASTACUS\*, nov. gen.

The anterior somite of the carapace is separated from the posterior by a distinct suture. The antero-lateral extremities of

\* *Nánnos*, dwarf; *ἀστακός*, marine crab.

the posterior portion of the carapace do not extend so far anteriorly as the rostrum, and do not meet in front. The pereion has four somites exposed posteriorly to the carapace. The eyes are sessile, and situated one on each side. The pereopoda have the seven joints normally developed, and support a secondary appendage. The four last somites of the pleon, with the telson, are wanting; therefore the form of the posterior pair of pleopoda and of the telson are not known.

*Nannastacus binoculoides*. Pl. I. fig. 4.

The anterior portion of the carapace is centrally elevated in the stomachal region, and crested by two parallel longitudinal rows of small beadlike tubercles. It is depressed centrally and elevated anteriorly and laterally, forming three conspicuous lobes: the anterior is an obtuse rostrum, rounded above, and covered with minute tubercles; the lateral lobes correspond with and support the organs of vision. The posterior division of the carapace is anteriorly produced laterally and inferiorly beyond the eyes. The infero-lateral margin not only ascends, but meets the anterior margin of the lateral processes at a right angle, the point of meeting being anteriorly produced into a sharp denticle. The posterior margin of the carapace is thickened into a strong and elevated ridge, which is dorsally crested with strong tubercles. The first two exposed somites of the pereion are very short, and are crested dorsally with fine tubercles. The third and fourth somites are longer than the first two, but they are also narrower, and have the dorsal tubercles more prominent than those on the preceding. Posterior to these are the only three somites of the pleon that are known; these are scarcely longer than broad, and are dorsally furnished with crests of small tubercles.

The characters of the posterior pairs of pleopoda and telson are unknown.

The eyes are small, sessile, and situated one on the centre of a lobe on each side of the head. The antennæ and organs of the mouth I have not been able to determine, from a reluctance to dissect a unique specimen.

The second pair of gnathopoda assimilate closely in form to those of the first pair of pereopoda in the normal *Diastylis*, and extend anteriorly in front of the carapace to some distance. The first four pairs of pereopoda have the coxæ small, and armed with tubercles; the bases are long and broad, and the remaining joints developed upon the type of true Macrurous Decapoda, terminating in sharp well-developed dactyli.

The last pair of pereopoda differ from the preceding in having the coxa very reduced in size, and the basis narrowed to slender proportions. A secondary appendage consists of a strong

basal joint, equalling in length the basis of the pereopod, and a terminal flagellum formed of many minute articuli, each of which supports strong cilia.

The entire animal is ornamented with numerous closely packed minute tubercles or coarse granules. They are most abundant, but least conspicuous, on the carapace, where they appear to culminate on the dorsal median line, being largest on the posterior ridge of the anterior somites of the pleon; they increase on the dorsal surface into short spines; the coxæ and bases of the four anterior pairs of pereopoda are also conspicuously granulated.

This little Crustacean, which is about the eighth of an inch in length, differs from the true *Diastylidæ* in several important particulars, all of which distinctions conduce to the opinion that it stands in the animal kingdom at a grade higher, or, to speak more correctly, in a position nearer to the true *Macrura*.

It will be seen that the eyes are two, and separated widely apart; but they differ from the *Macrurous* type in being sessile and attached to the anterior portion of the carapace: in this respect they differ from the same organs in the true *Macrura*, since those are pedunculated, and, even in the larval condition, exist as free organs independent of, though closely protected by, the tissues of the carapace.

In all the *Diastylidæ* that have been hitherto described, the antero-lateral processes of the posterior portion of the carapace pass before and meet in front of the anterior portion of the carapace, enclosing it so as to bring it near the centre of the carapace. In the animal now described these lateral processes reach but little beyond the eyes; but we see, as it were, an effort to fulfil the same conditions in the prolongation of the inferior angle beyond the superior, whereas in the *Macrurous* type this is considerably rounded off.

It is to be regretted that this solitary specimen has alone been obtained from the numerous dredgings on the coast of Shetland; but it is to be hoped that, since now attention is drawn to the creature, we may be able to obtain more of an animal which, from its intermediate character, may offer in dissection conditions of considerable interest, that may assist in unravelling the mystery of some of the lost parts of certain fossil Crustacea.

#### EXPLANATION OF PLATE I.

*Fig. 1. Diastylis echinatus.*

*Fig. 2. Diastylis bicornis.*

*Fig. 3. Diastylis borealis.*

*Fig. 3 k.* First pair of pereopoda.

*Fig. 4. Nannastacus binocoloides* (lateral view).

*Fig. 4''.* The same (dorsal view).